



Armed Forces College of Medicine AFCM



Speech Physiology & Speech Disorders

**Prof. Dr. Mona Ahmed
Ahmed**

**Professor of Physiology, Faculty of Medicine,
Ain Shams University**

INTENDED LEARNING OBJECTIVES (ILO)



By the end of this lecture the student should be able to:

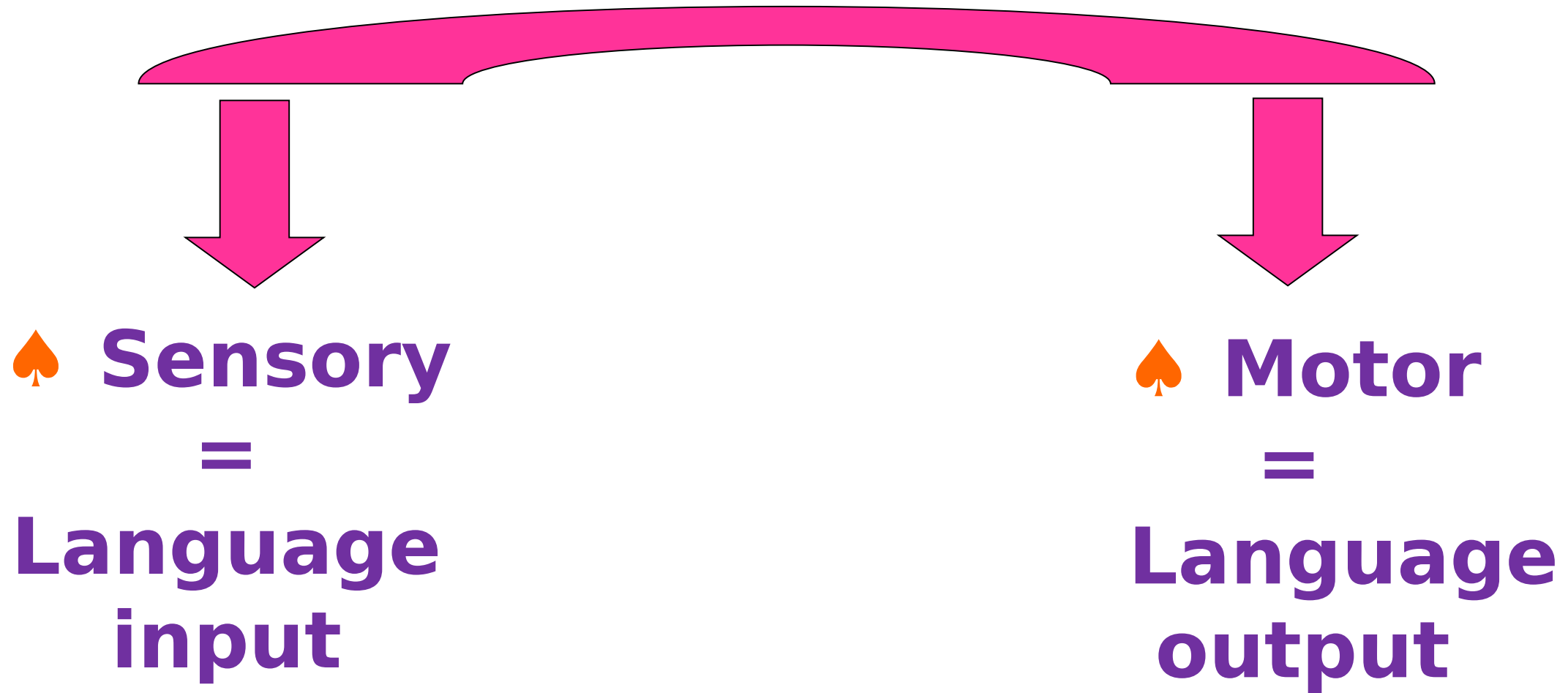
- 1. Define speech**
- 2. List the types of speech (spoken & written)**
- 3. Explain the mechanism of speech**
- 4. List the types of speech disorders**

Speech



- ❖ **Means of communication between persons**
- ❖ **Ability to express words in response to visual and auditory stimuli**
- ❖ **Highest cortical function**
- ❖ **The function of the categorical hemisphere**

Aspects of Communication





Aspects of Communication

Sensory

Visual

Auditory

Verinke's area

Motor

Broca's area

Exner's area

Sensory Aspect of Communication



- **Visual**

Visual association area

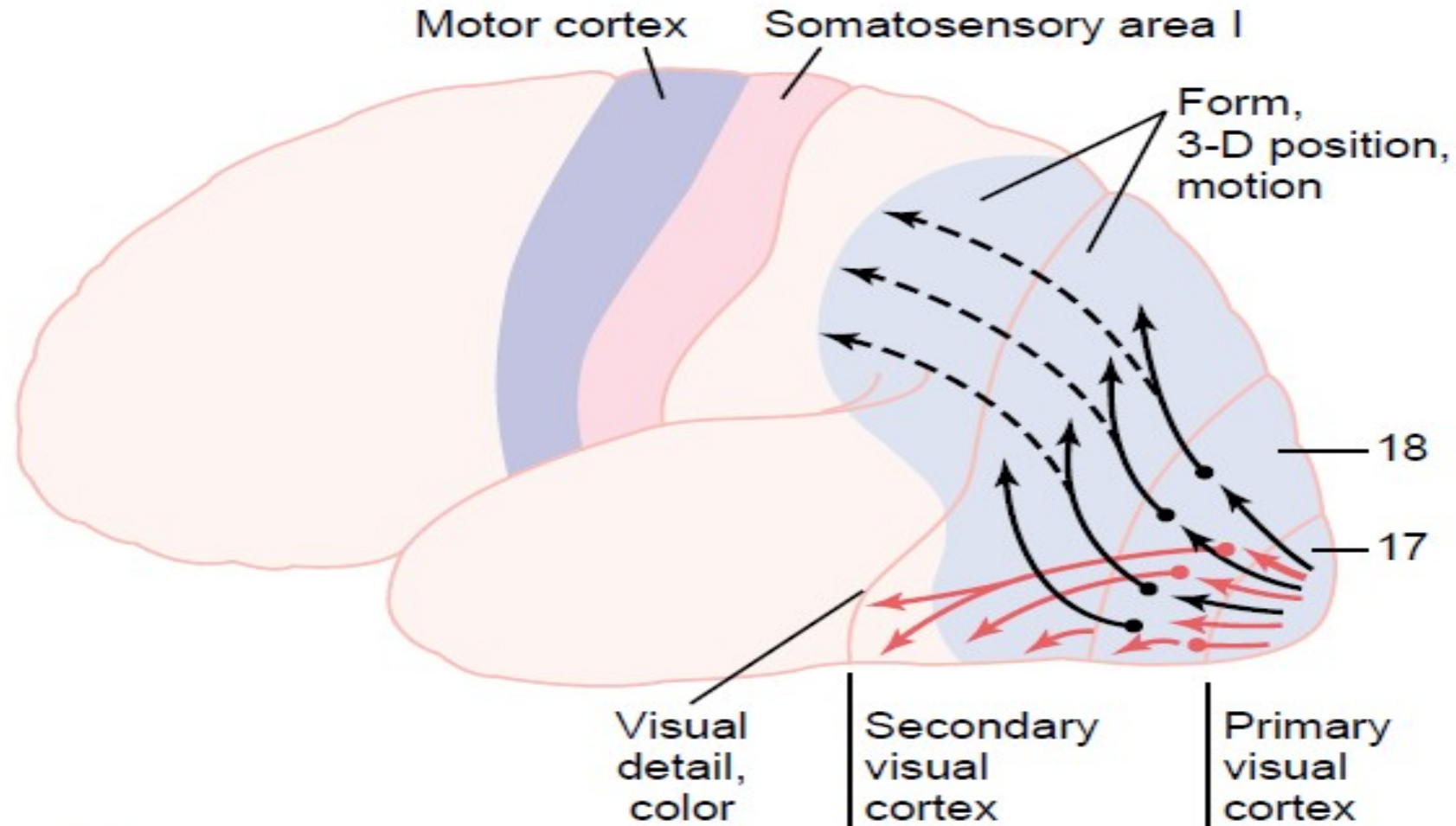
- **Auditory**

Auditory association area

- **Werinke's Area (Sensory center of speech)**

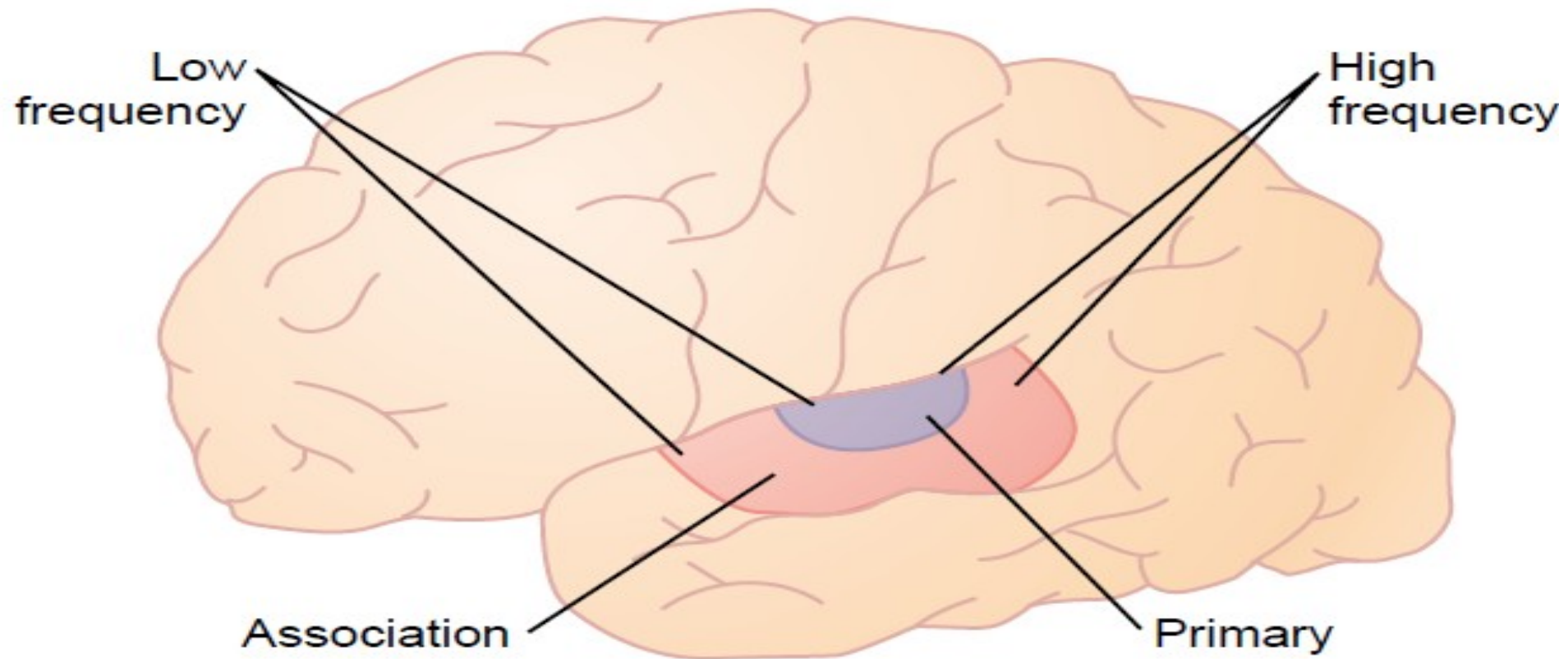
General interpretative area

Visual Association Area



<https://slideplayer.com/slide/5256757/>

Auditory Association Area

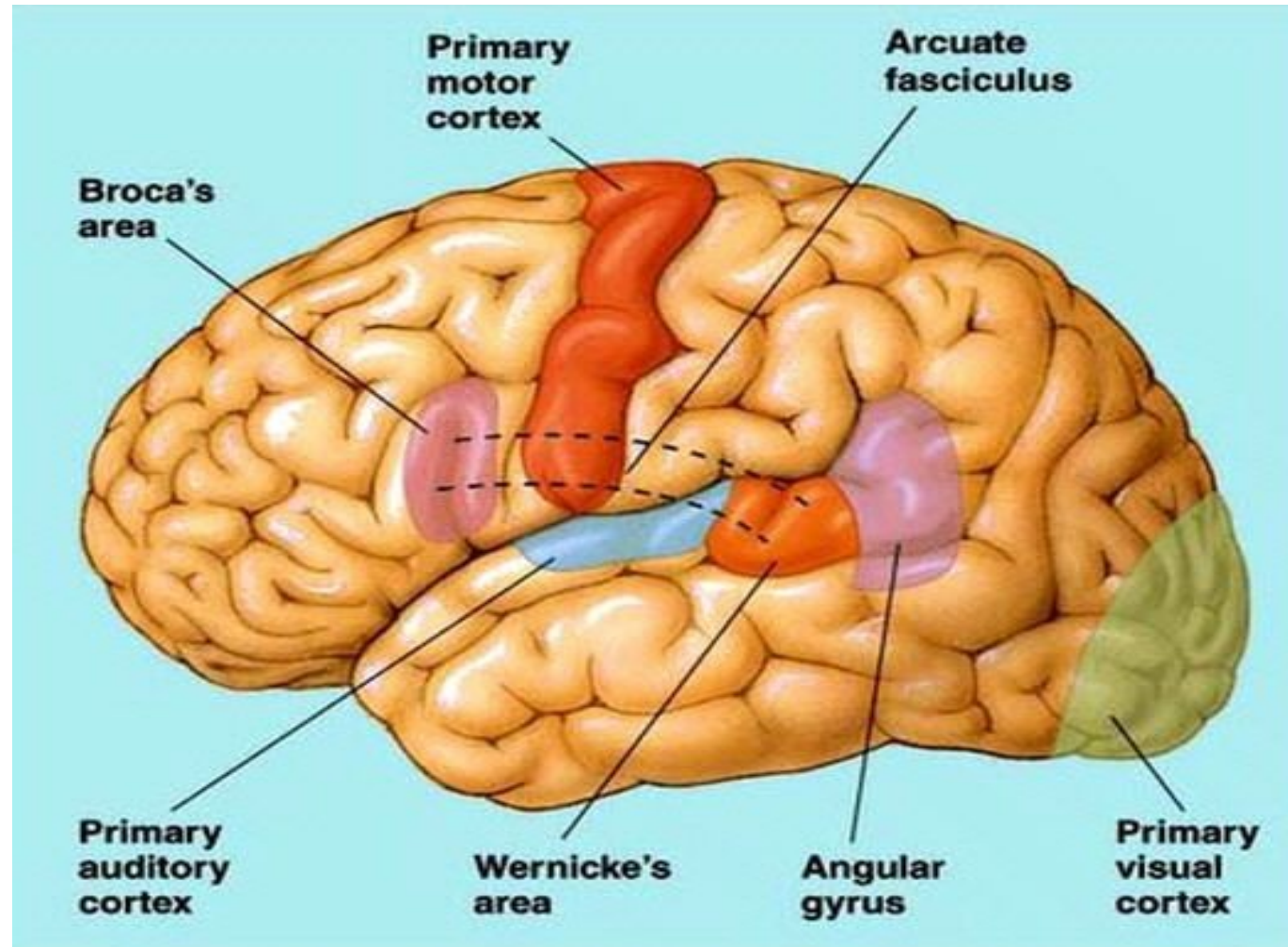


<https://www.euroformhealthcare.biz/medical-physiology/sound-frequency-perception-in-the-primary-auditory-cortex.html>

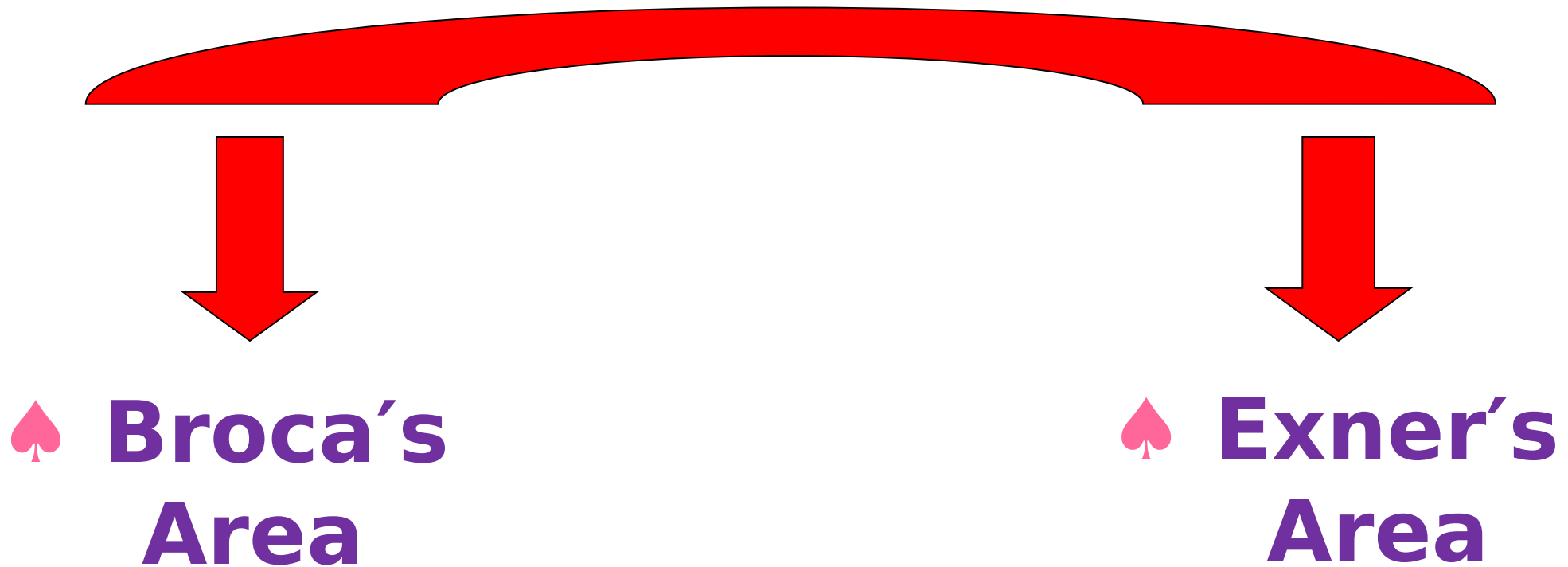
Werinke's Area



Sensory center of speech



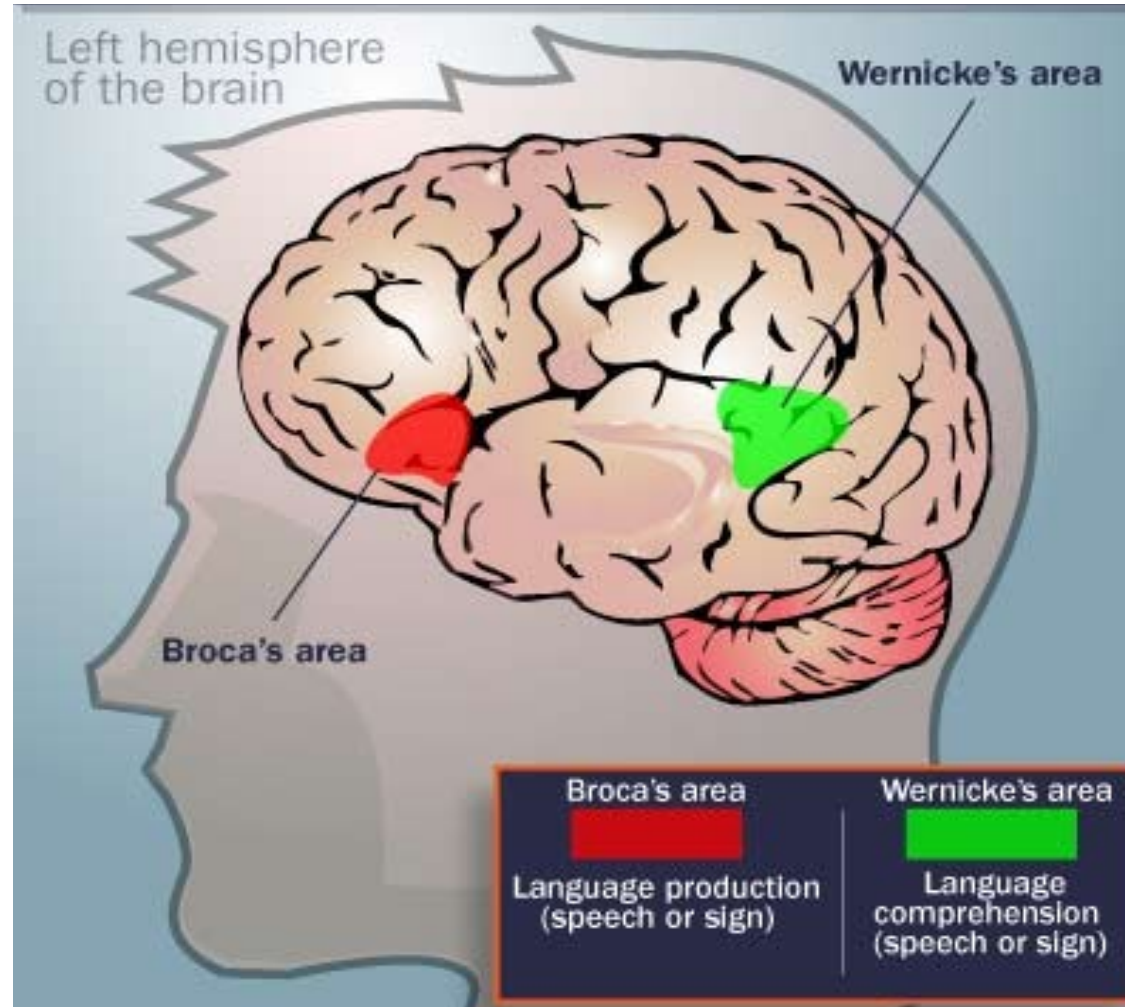
Motor Aspect of Communication



Broca's Area



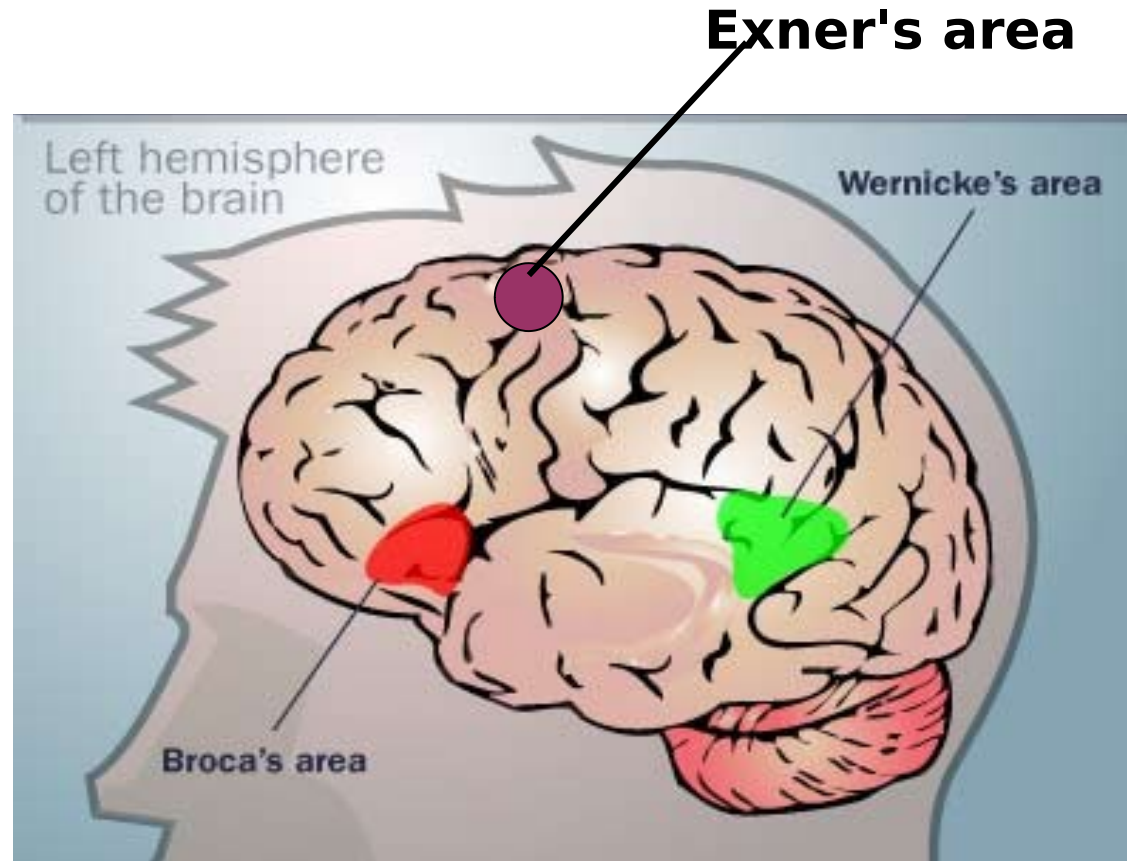
(Word Formation Area)
Motor center of speech



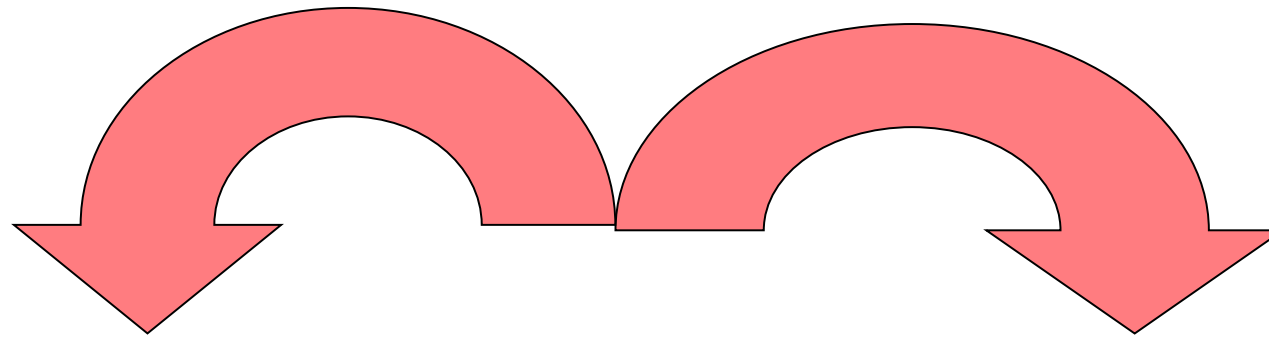
Exner's Area



(Hand Skills Area)



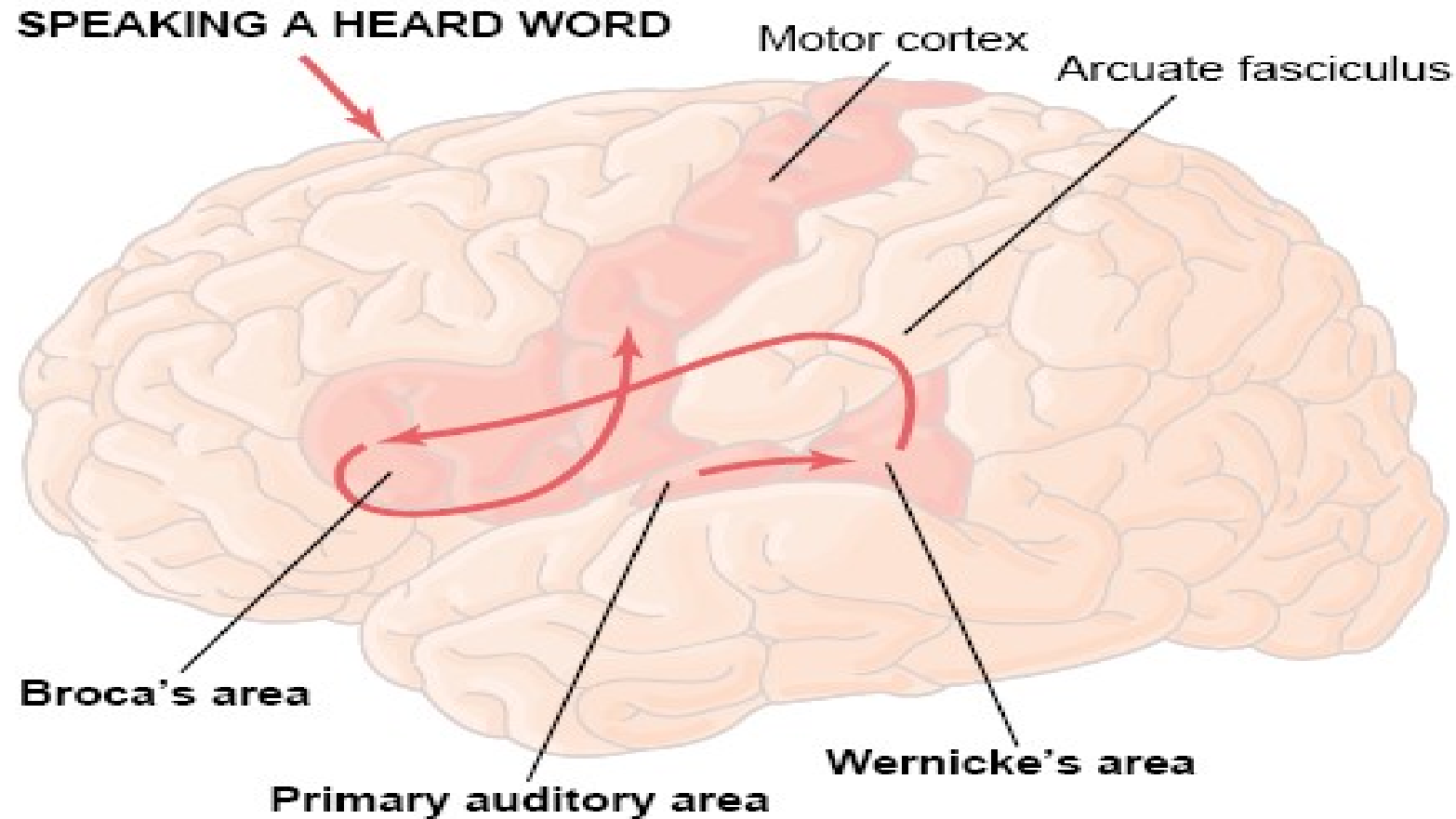
Mechanism of Speech



♣ **Spoken
Speech**

♣ **Written Speech**

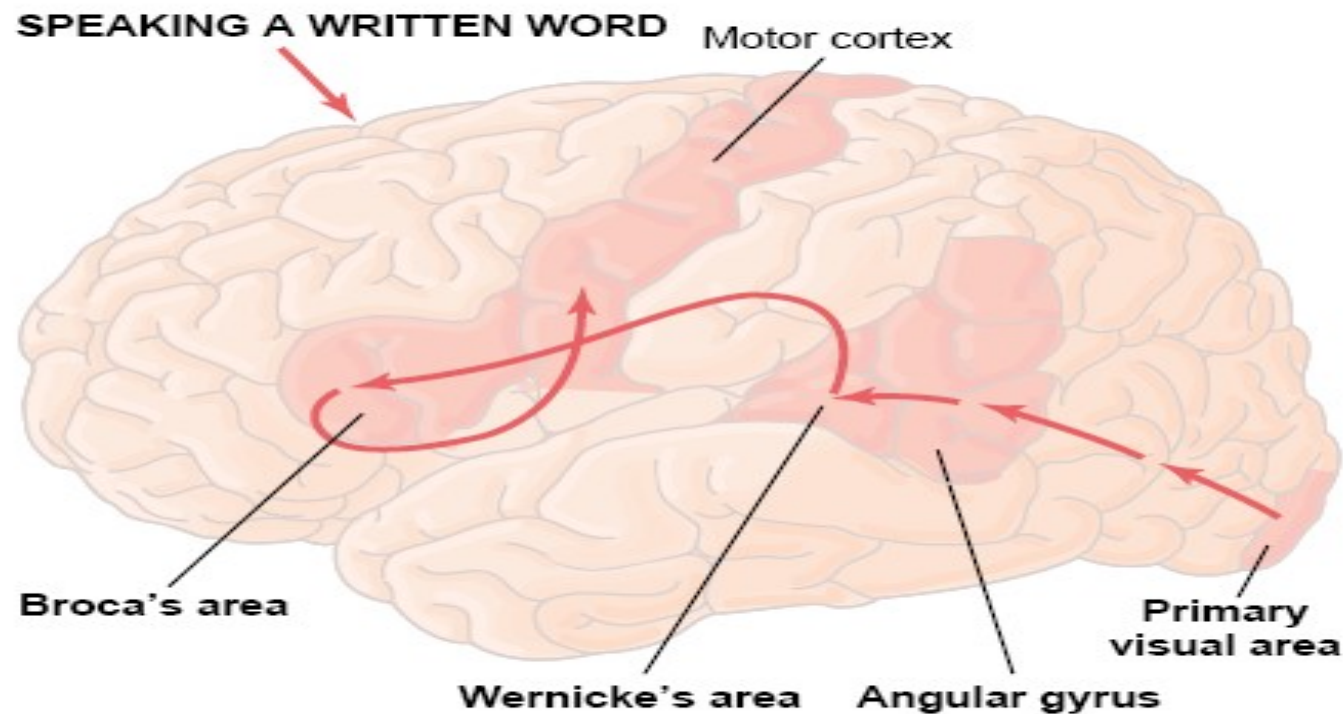
Mechanism of Spoken Speech



Mechanism of Written Speech

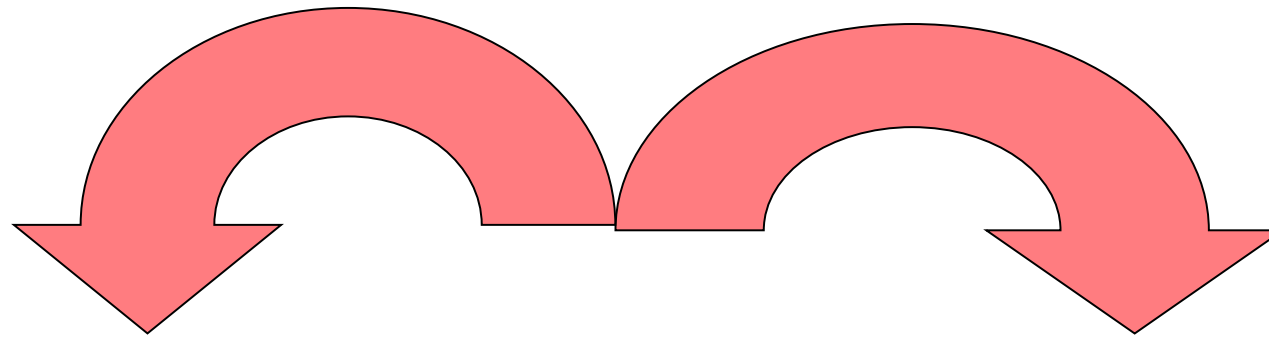


(Reading)



<https://mdm-arabi.tumblr.com/post/70408280877/brain-pathways-for-top-perceiving-a-heard-word/am>

Speech Disorders



♣ **Aphasia**

♣ **Dysarthria**



Dysarthria	Aphasia	
Abnormality of speech due to defect in act of articulation.	Abnormalities of language functions that not due to defects of vision or hearing or motor paralysis.	Definition
<ul style="list-style-type: none">• UMNL• LMNL• Neocerebellar S• Parkinsonism• Basal ganglia damage	<ul style="list-style-type: none">• Lesions in categorical hemisphere.• Embolism / thrombosis of a cerebral blood vessel.	Causes
<ul style="list-style-type: none">• Spastic• Flaccid• Ataxic• Hypokinetic	<ul style="list-style-type: none">• Sensory• Motor• Global	Types

Aphasia



**Sensory
Aphasia**
= Receptive
aphasia
= Fluent
aphasia

**Global
=
General
aphasia**

**Motor
aphasia**
= Expressive
aphasia
= Non fluent
aphasia



Sensory Aphasia

**Visual aphasia
= Word blindness**

**Auditory aphasia
= Word deafness**

Wernike's

Conductive Aphasia



- **Due to lesions near the auditory cortex.**
- **Patient cannot put parts of words together.**
- **or conjure up words.**
- **or repeat phrases or words correctly.**

Anomic Aphasia



- It is due to isolated lesion in angular gyrus.
- Patient finds difficulty in naming seen objects only.
- Unable to understand written words and pictures.

Motor Aphasia



**Broca's
Aphasia**

Agraphia

Motor Aphasia



Agraphia	Broca's Aphasia	
Exner's area hand skills area.	Broca's area.	Site of Lesion
Patient can not express himself by written words, although he knows what to write.	Patient can not express himself by spoken words although he knows what he wants to say. Speech is slow, hard to come and limited to two or three words only.	Characteristics

Lecture Quiz



1. Which of the following is a motor speech area? (more than one answer can be selected)

- A. Visual association area**
- B. Auditory association area**
- C. Werinke's area**
- D. Exner's area**
- E. Broca's area**

2. Speech interpretation is the function of:

- F. Exner's area**
- G. Broca's area**
- H. Werinke's area**
- I. Visual association area**
- J. Auditory association area**

Lecture Quiz



3. A man after head injury developed speech disorder. He feels difficulty in uttering words and his speech became limited. He is most likely having lesion in:

- A. Arcuate fasciculus**
- B. Broca's area.**
- C. Secondary visual area**
- D. Wernick's area**
- E. Temporal lobe**

4. Signs of sensory (Wernicke's aphasia) are (more than one answer is suggested)

- F. non-fluent, hesitant speech**
- G. speech nonsensical but fluent**
- H. non existent words**
- I. good comprehension**
- J. name of pictures is missing**

SUGGESTED TEXTBOOKS



- 1. Ganong's Review of Medical Physiology. 25th edition.**
- 2. Guyton and Hall. Textbook of Medical Physiology. Thirteenth edition.**
- 3. Introduction to Human Physiology. Lauralee Sherwood. 8th edition.**

Thank You

